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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/894,874

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Soon Sung Yoo

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MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 09/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/894,874

Applicant(s)

YOO ET AL.

Examiner

Erik Kielin

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 10-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This action responds to the Amendment filed 14 July 2004.

Claim Objections

1. Claim 19 is objected to because of the following informalities:

in line 5, replace "contract" with --contact-- for correct spelling.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,966,589 (**Watanabe et al.**) in view of US 6,016,174 (**Endo et al.**).

Regarding claim 1, **Watanabe** discloses a pad structure for a liquid crystal display, comprising:

- a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross-section of Fig. 4);
- a plurality of gate pads and data pads **3, 5, 9** formed on the substrate **18**;
- an insulating film **13-15** formed on surfaces of the gate pads and data pads **3, 5, 9**;
- a plurality of transparent conductive layers **12** electrically connected to the gate pads and the data pads **3, 5, 9**; and

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an anisotropic conductive film formed on the transparent conductive layers **12** (col. 9, lines 51-64).

Watanabe does not indicate the extent of coverage of the transparent conductive layers **12** with the anisotropic conductive film.

Endo teaches a pad structure similar to that in **Watanabe** for a liquid crystal display including a plurality of gate pads and data pads **20, 24** formed on the substrate (Figs. 3, 4, and 14; col. 14, lines 18-27); an insulating film **3, 8** formed on surfaces of the gate pads and data pads **20, 24**; a plurality of transparent conductive layers **22, 26** formed of indium tin oxide electrically connected to the gate pads and the data pads **20, 24** (col. 19, lines 9-61); and an **anisotropic conductive film**, ACF, formed on the transparent conductive layers **22, 26** to cover entire upper and side surfaces of the transparent conductive layers (not shown but expressly indicated at paragraph bridging cols. 11-12 --especially the last sentence-- and at col. 23, lines 9-42 --especially the last two sentences). In this regard, **Endo** states,

“In this event, as shown in FIG. 3 and FIG. 4, ACF is placed at the position **completely covering the first TCP terminal contact 22 and the second TCP terminal contact 26**, that is, the first TCP connecting range 23 and the second TCP connecting range 27. By doing so, the contact hole level difference portion of the TCP terminal portion is covered with ACF, and even when crack, etc. are generated in the conductive thin film at the level difference portion, the display portion lead-out electrode is no longer exposed to humidity in the atmosphere, and the corrosion by humidity can be prevented.” (Emphasis added.)

Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention to cover the entirety of the upper and side surfaces of the transparent conductive film of **Watanabe** with the anisotropic conductive film in order to provide reliable electrical

connection to the pads while protecting the connection from damage and corrosion due to humidity, as taught to be beneficial in **Endo**.

Further in this regard, note that the gate and data **3, 9** pads shown in the Fig. 7N of **Watanabe** having ITO contact portions **12** having ends. **Endo** shows in Figs. 3 and 4 and states --as in the excerpt above-- that the ACF extends beyond the contact holes, “completely covering” the first and second terminal over the “connecting range” to prevent damage from humidity. Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention to cover the entire ITO structure in **Watanabe** by ACF, in order to prevent damage from humidity, as taught by **Endo**.

Regarding claim 2, **Watanabe** discloses the insulating film **13-15** extends over side surfaces and upper surfaces of the gate pads and the data pads **3, 5, 9** (Figs. 4-6).

Regarding claim 3, **Watanabe** discloses the insulating film **13-15** contacts the substrate **18** at end portions of the gate pads and data pads **3, 5, 9** (Figs. 4-6).

Regarding claim 4, **Watanabe** discloses the transparent conductive layers **12** include indium tin oxide (col. 6, lines 62-65).

Regarding claim 5, **Watanabe** discloses the insulating film **13-15** is formed by laminating a gate insulating film **14** and a protective film **13, 15** (Figs. 7C-7D; col. 5, lines 41-55).

4. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Watanabe** in view of **Endo** and further in view of Applicant’s admitted prior art (**APA**).

The prior art of **Watanabe** in view of **Endo**, as explained above, discloses each of the claimed features except for the grinding area.

Regarding independent claim 6, **Endo** discloses a pad structure for a liquid crystal display including a pad contact area and an anisotropic conductive film deposit area, the pad structure comprising:

APA teaches that it is known in the art for a pad structure to have a grinding area **II** (**APA** prior art Figs. 1 and 2; instant specification paragraphs [0010]-[0013]).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to have a grinding area in the pad structure of **Watanabe**, because **APA** teaches that this is conventional in the art. One of ordinary skill would be motivated to use conventional methods for separating LCDs in order to save time money and labor in research and development of new separating methods.

Regarding claim 7, **Watanabe** discloses that the insulating film **13-15** is formed on side surfaces and upper parts of the gate and data pads **3, 5, 9**.

Regarding claim 8, **Watanabe** discloses that the gate and data pads **3, 5, 9** are formed on a substrate **18**, and the insulating film **13-15** --particularly **14**-- contacts the substrate at end portions of the gate pads and data pads **3, 5, 9**.

Regarding claim 9, **Watanabe** discloses that the gate insulating film **14** is formed between the gate and data pads **3, 5, 9** (Figs. 4-6).

5. Claims **19** and **20** are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,966,589 (**Watanabe et al.**) in view of **APA**.

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Regarding claim 19, **Watanabe** discloses a pad structure for a liquid crystal display, comprising:

a substrate **18** (Figs. 4-6: Figs. 5 and 6 are cross-section of Fig. 4);

at least one pad **3, 5, 9** formed on the substrate **18**;

an insulating film **13-15** formed on the pad **3, 5, 9** the insulating film covering side surfaces of the pad **3, 5, 9** and a portion of the substrate **18** adjacent to the side surfaces of the pad; and

at least one conductive layer **12** connected to the pad **3, 5, 9** through contact holes **10a, 10b, 10c** defined through the insulating film **13-15**.

Watanabe does not indicate that there exists a grinding area having no insulating film formed thereover.

APA teaches that it is known in the art for an LCD to have a grinding area **II** (**APA** prior art Figs. 1 and 2; instant specification paragraphs [0010]-[0013]).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to have a grinding area, absent the insulating film, in the pad structure of **Watanabe**, because **APA** teaches that this is conventional in the art. One of ordinary skill would be motivated to use conventional methods for separating LCDs in order to save time money and labor in research and development of new separating methods. One of ordinary skill would be motivated to omit other layers from this are to speed up and simplify the grinding process by grinding through only the substrate material as opposed to a plurality of other layers.

Regarding claim 20, **Watanabe** discloses a liquid crystal display formed on a substrate **1**, comprising:

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an active region defined at a first portion of the substrate (called "DISPLAY PORTION" IN Fig. 3e); and

a pad contact area (called "terminal 100") defined on a second portion of the substrate adjacent to the active region (Fig. 3D), the pad contact area including:

at least one pad 3, 5, 9 formed on the substrate 18,

an insulating film 13-15 formed on the pad 3, 5, 9,

at least one conductive layer 12 connected to the pad 3, 5, 9 through contact holes 10a, 10b, 10c defined through the insulating film 13-15, wherein the insulating film 13-15 covers the side surfaces of the pad and a portion of the substrate 18 adjacent to the side surfaces of the pad (Fig. 3A; col. 6, lines 9-38).

Watanabe does not indicate that there exists a grinding area having no insulating film or conductive film formed thereover.

APA teaches that it is known in the art for an LCD to have a grinding area II (APA prior art Figs. 1 and 2; instant specification paragraphs [0010]-[0013]).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to have a grinding area, absent the insulating film, in the pad structure of **Watanabe**, because **APA** teaches that this is conventional in the art. One of ordinary skill would be motivated to use conventional methods for separating LCDs in order to save time money and labor in research and development of new separating methods. One of ordinary skill would be motivated to omit other layers from this are to speed up and simplify the grinding process by grinding through only the substrate material as opposed to a plurality of other layers.

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Response to Arguments

6. Applicant's arguments filed 14 July 2004 have been fully considered but they are not persuasive.

Applicant argues,

“In response, the Final Office Action asserts that ‘in the absence of a teaching away from the conventional wisdom, one of ordinary skill in the art would be especially motivated to use conventional wisdom because it saved enormous amounts of time, money, and labor.’ However, neither the Final Office Action nor the current Office Action has not provided any evidence or other showing that the grinding area has any association or benefit with respect to saving ‘time, money, and labor.’ Accordingly, if this line of reasoning is being maintained, Applicants respectfully request that documentary evidence of the Final Office Action’s assertion be provided.”

As per Applicant’s request, evidence is provided. Applicant is referred to two articles regarding LG Phillips LCD --assignees of the instant invention-- expenditures on research and development and the work force required. Apparently, LG Phillips is projected to spend (Won) 30 trillion by 2010 and hire 11,800, hardly a time, money, and labor saving process. Accordingly, Examiner is perplexed that Applicant’s could proffer an argument contrary to their own knowledge research and development.

Applicant is additionally referred to US 2004/0158808 (Hansen) for another example. Hansen states in paragraph [0030],

“As the product cycle times in the semiconductor field are relatively short, **severe limitations** are put on the amount of **time** that can be spent on **research and development for each new product line or manufacturing process.**” (Emphasis added.)

Accordingly, conventional wisdom is preferred to one of ordinary skill in the art in order to save time money and labor associated with R&D.

Applicant's arguments with respect to the remaining claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 6-3658 teaches an LCD having a grinding region formed apart from the pad structures to simplify the cutting process and leave the pad structures intact.

US 5,893,625 (**Tamatani et al.**) teaches an LCD having a grinding region formed apart from the pad structures (col. 4, lines 30-35; Fig. 6).

US 5,492,582 (**Ide et al.**) teaches an LCD having a grinding region formed apart from the pad structures and having no insulating or conductive regions formed in the grinding area (Figs.).

US 6,143,189 (**Gluech et al.**) teaches an LCD having a grinding region formed apart from the pad structures and having no insulating or conductive regions formed in the grinding area (Figs.).

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Erik Kielin
Primary Examiner
21 September 2004